

NEBRASKA ARBOVIRUS SURVEILLANCE AND MOSQUITO MONITORING PROGRAM 2018 UPDATE #9

Date: 08/10/2018. Please note that mosquito collection data covers dates 07/22/2018 to 08/04/2018 (CDC Weeks 30 and 31). Bird, human, and equine surveillance may include data from beyond these dates. All data is provisional and may change.

SUMMARY

- **Climate:** Over the past 30 days (dates 07/06/2018 to 08/04/2018), precipitation has been above normal over a large swath of the north central and western Nebraska with some areas seeing >200% of normal precipitation. Areas in east central, south central, and southeastern Nebraska saw below normal moisture amounts. Cumulative rainfall during this timeframe ranged from 0.5 to ≥7.0 inches across the state. The heavier amounts were located primarily in north central and western Nebraska. Average temperatures for the last 30 days (date ending 08/04/2018) were below normal over most of the state. Per the United States Drought Monitor, abnormally dry conditions increased slightly with moderate drought conditions decreasing slightly. However, severe drought conditions increased slightly in far southeastern Nebraska.
- **Three Month Forecast:** For August 2018 to October 2018, the NOAA outlook is predicting an elevated probability of above normal temperatures across Nebraska and equal chances of above or below normal precipitation over most of the state.
- **Mosquito Numbers- Eastern Nebraska:** Individual county collections for the reported two weeks of sampling ranged from “low” to “extremely high” based on historical county data. Overall in the east region, mosquito numbers decreased and are now “moderate” based on historical data from regional traps. *Aedes vexans* (Inland floodwater mosquito) was no longer the most abundantly collected mosquito from CDC light traps in the region. *Culex tarsalis* (primary vectors of West Nile virus) counts made up the majority of trap collections (89.3%) in the region. *Culex* mosquito counts decrease but are still “very high” based upon historical regional data. Individual county collections ranging from “low” to “extremely high”. Eleven invasive *Aedes albopictus* (Asian tiger mosquito) were collected from the region. All specimens were collected from Richardson County at trap sites that have produced *Aedes albopictus* historically.
- **Mosquito Numbers- Central Nebraska:** Individual county collections for the reported two weeks of collecting ranged from “low” to “high” based on historical data. Overall mosquito numbers decreased compared to the previous update and remained “low”. *Aedes vexans* was the most collected

mosquito (36.4%) from region traps. *Culex* mosquito counts increased to “moderate” levels based upon historical regional data, with individual counties ranging from “low” to “very high” based upon their historical data. *Culex tarsalis* made up the majority of the collected *Culex*, accounting for 48.7% of collections over the sampling period. No invasive *Aedes albopictus* were collected from the region.

- **Mosquito Numbers- Western Nebraska:** Individual county collections for the reported two weeks ranged from “low” to “extremely high” compared to their historical data. Overall mosquito activity from regional traps decreased but were still considered “high”. *Culex tarsalis* was the again the most abundant mosquito collected in CDC light traps (45.8%). *Culex* mosquito counts decrease slightly but are still considered “very high” based upon historical regional data. Individual *Culex* counts across counties in the west region ranged from “low” to “extremely high” based upon their historical data. No invasive *Aedes albopictus* were collected from the region.
- **Arboviral Detections:** Over the two weeks of mosquito surveillance covered in this report **WNV activity in mosquitoes has ramped up quickly. Thirty-one have been detected** over the last two weeks. The increase in positive mosquito pools demonstrates that WNV is circulating in the environment and activity has increased in mosquito populations. To date 1,350 *Culex* pools have been tested with **37 WNV positives detected to date**. The current WNV cumulative statewide minimum mosquito infection rate increased (1.29/1,000 *Culex*) and is just above the 10-year median (1.28/1,000 *Culex*) for this time of year. No positive pools for St. Louis Encephalitis (SLE) or Western Equine Encephalitis (WEE) viruses were detected over the two weeks and zero have been detected for the season.
- **Dead Bird Surveillance:** To date 125 birds have been reported. Of the 125 birds reported, 13 have been a corvid birds (bird group most heavily impacted by WNV and includes: blue jays, crows, and magpies). **The first WNV positive bird of the season has also been detected in a bird submitted from Douglas County.** Of the six birds reported who have met criteria for WNV testing, three were negative, one bird unsuitable for testing, one was positive, and one test result is pending.
- **Equine Surveillance:** Currently no equine cases of WNV have been reported for the season.
- **Human Mosquito-borne Disease Cases:** **Eight human clinical WNV cases** have currently been reported along with **five asymptomatic human blood donors** in Nebraska residents. Additionally, a total of four travel-related mosquito-borne disease have occurred in state residents: three malaria cases and one dengue case.

Comment: *Eight human clinical (symptomatic) WNV cases have been reported in Nebraska residents to date, two of which were the severe neuroinvasive form. Additionally, five asymptomatic human blood donors have been reported. Furthermore, 37 WNV mosquito pools have been detected from mosquito samples. WNV activity has increased over the last two weeks and Individuals should take proper mosquito prevention activities to reduce mosquito bites as we go through the historically highest risk month of the season (August). Additionally, four travel-related mosquito-borne illness cases, three malaria and one dengue case, have been reported in Nebraska residents returning from overseas travel. Individuals are strongly encouraged to practice proper mosquito prevention anytime mosquitoes are present or likely to be present no matter where they are to decrease their chances of acquiring a mosquito-borne illness.* Statewide, overall mosquito collections from CDC light traps saw a decrease in overall mosquito numbers with the statewide average seeing “high” counts when compared to historical data, averaging 192.74 total mosquitoes per trap night. The most abundant mosquito collected over the two week sampling period was the primary WNV vector mosquito, *Culex tarsalis*, accounting for 51.2% of trap collections. *Culex* mosquito counts statewide decrease but were still “very high” based on historical data, averaging 108.18 *Culex* per trap night.

ENVIRONMENTAL CONDITIONS

Environmental and climate conditions can impact mosquito-borne diseases by influencing mosquito numbers and mosquito infection prevalence. For example, drought has been identified as a primary driver of WNV epidemics. This is why rainfall, temperature, and drought conditions are monitored closely during the mosquito surveillance season.

Rainfall and Temperature

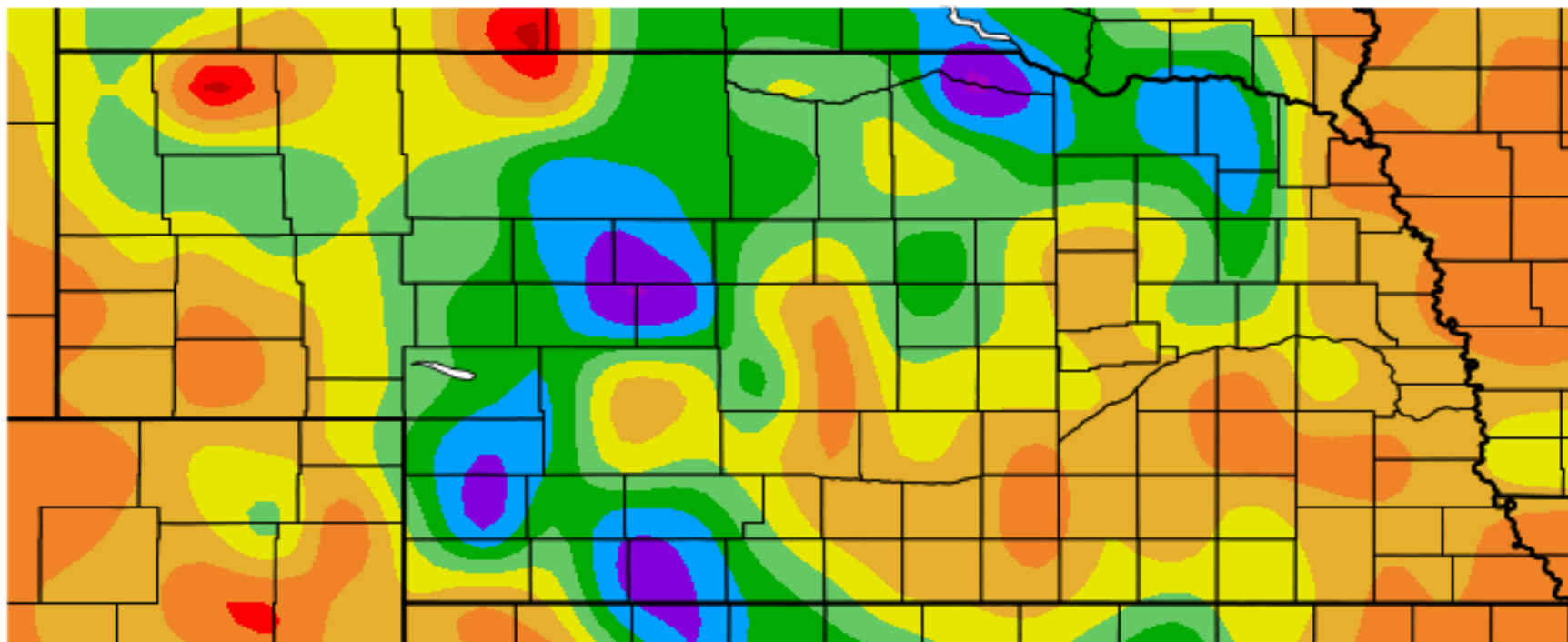
Rainfall across Nebraska over the last 30 days (07/06/2018 to 08/04/2018) ranged from 0.5 to ≥ 7.0 inches (pg. 4) across the state. The heavier amounts were located in north central and western Nebraska. For the last 30 days (date ending 08/04/2018), rainfall was well above normal over a large area of north central and western Nebraska and below normal in some areas of east central, south central, and southeastern Nebraska (pg.5). Average temperatures (pg. 6) for the last 30 days were below normal over most of the state. The long range outlook (next 8 to 14 days), is predicting higher odds of below normal temps over most of the state. Precipitation is predicted to be near median over most of the state. More climate and forecast information can be found at:

High Plains Regional Climate Center at: <https://hprcc.unl.edu/index.php>

National Weather Service 8 to 14 day outlooks: <http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php>

Precipitation (in)

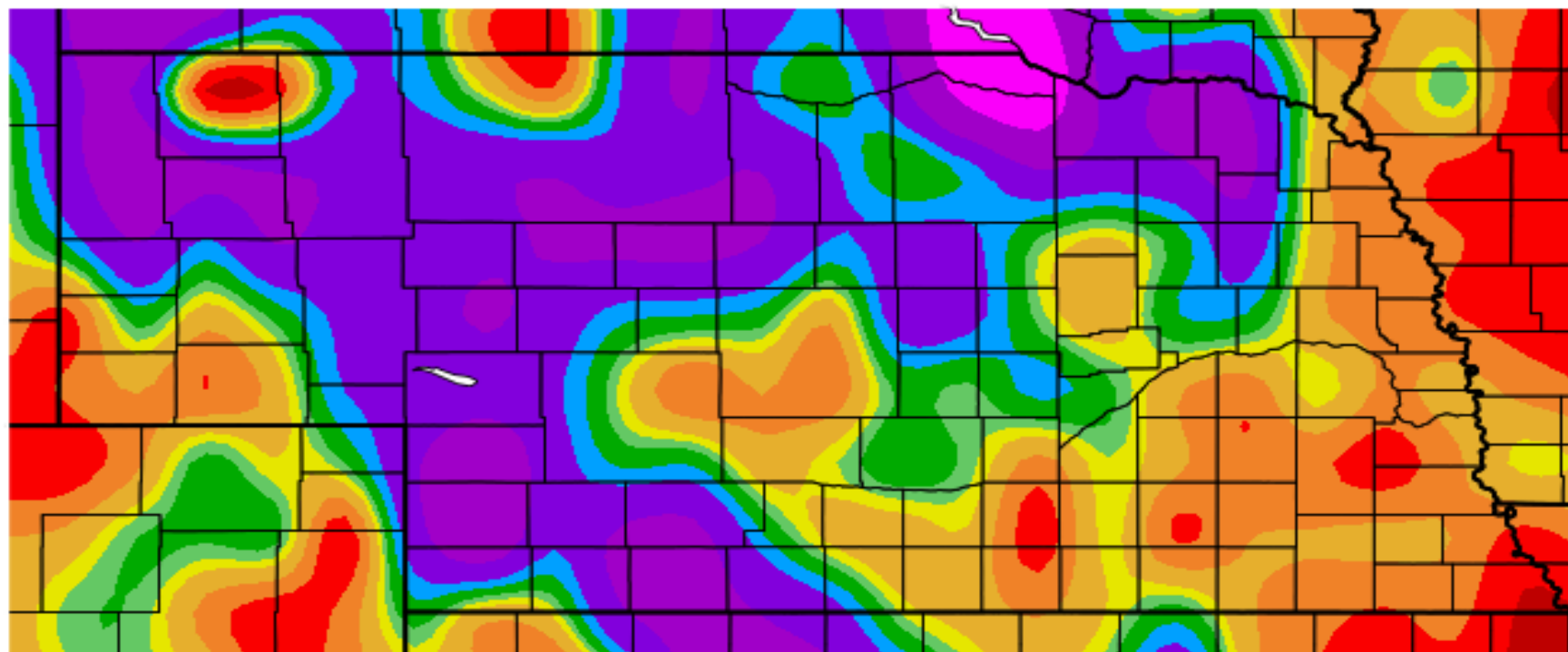
7/6/2018 – 8/4/2018



Generated 8/5/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

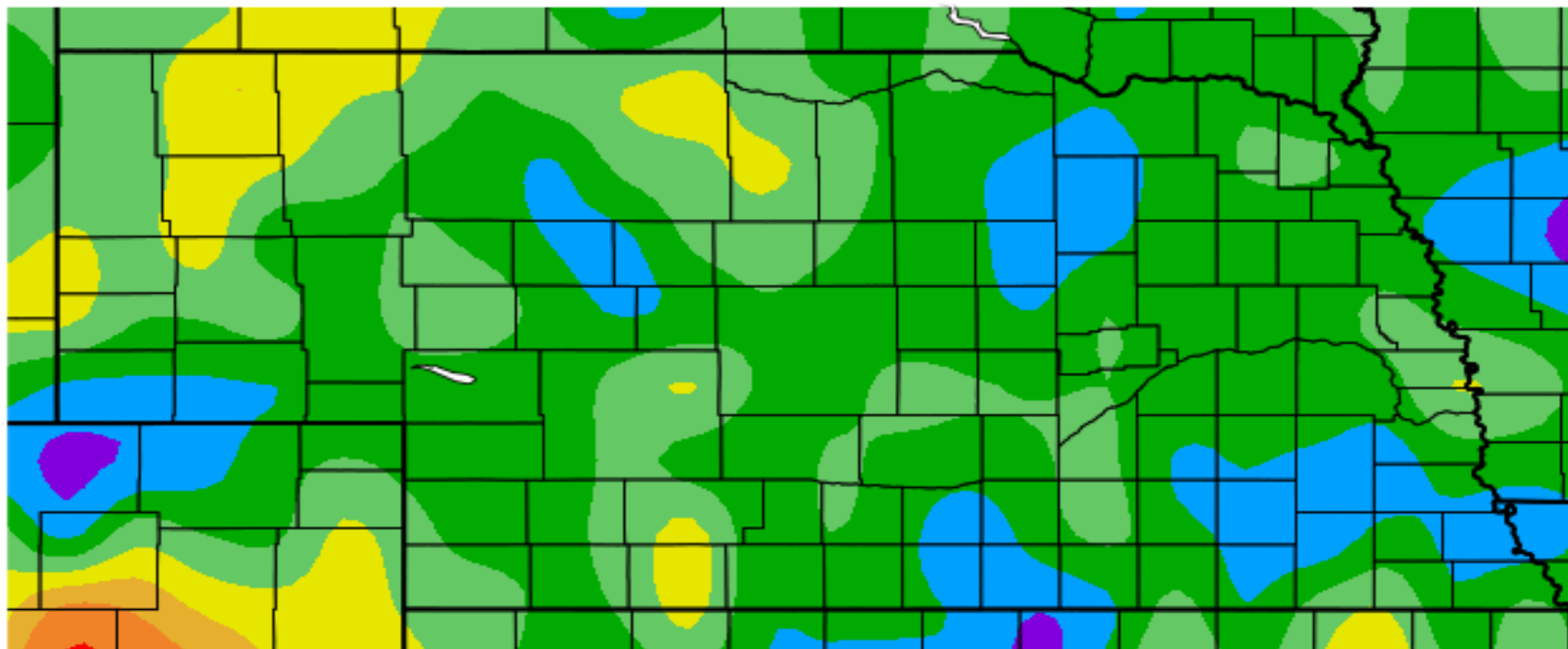
Percent of Normal Precipitation (%)
7/6/2018 – 8/4/2018



Generated 8/5/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Temperature (F) 7/6/2018 – 8/4/2018



Generated 8/5/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

Three Month Temperature and Rainfall Forecast

For August 2018 to October 2018, forecast predictions for Nebraska are for an elevated probability of above normal temperature over most of the state and equal chances for above and below normal precipitation. Links for the pages containing graphics of the long-term outlook can be found here:

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1 (Temperature and Rainfall Outlook).

Drought Outlook

The current drought monitor on page eight (through 07/31/2018) showed abnormally dry condition in portions of south central and southeast Nebraska. Approximately 95.00% of the state is being reported with no drought or abnormally dry conditions, a slight increase compared to last week. Currently the land area in the state encompassing abnormal dryness is approximately 4.13% (slight decrease) and moderate drought around 0.79% (slight decrease) of the state area. Additionally, a small area of severe drought (.08%) has developed in far southeastern Nebraska. Last year at this time, 14.32% of the state area reported no drought or abnormally dry conditions per the drought monitor. The current monthly drought outlook for July can be found on page nine. For more information please visit the links below:

<http://droughtmonitor.unl.edu/> (U.S. Drought Monitor).

http://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.php (U.S. Monthly Drought Outlook).

U.S. Drought Monitor Nebraska

August 7, 2018

(Released Thursday, Aug. 9, 2018)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	94.36	4.59	0.60	0.45	0.00	0.00
Last Week <i>07-31-2018</i>	95.00	4.13	0.79	0.08	0.00	0.00
3 Months Ago <i>05-08-2018</i>	77.14	20.82	2.04	0.00	0.00	0.00
Start of Calendar Year <i>01-02-2018</i>	9.32	88.65	2.03	0.00	0.00	0.00
Start of Water Year <i>09-26-2017</i>	82.67	13.32	4.01	0.00	0.00	0.00
One Year Ago <i>08-08-2017</i>	21.15	55.04	20.84	2.97	0.00	0.00

Intensity:

 D0 Abnormally Dry	 D3 Extreme Drought
 D1 Moderate Drought	 D4 Exceptional Drought
 D2 Severe Drought	

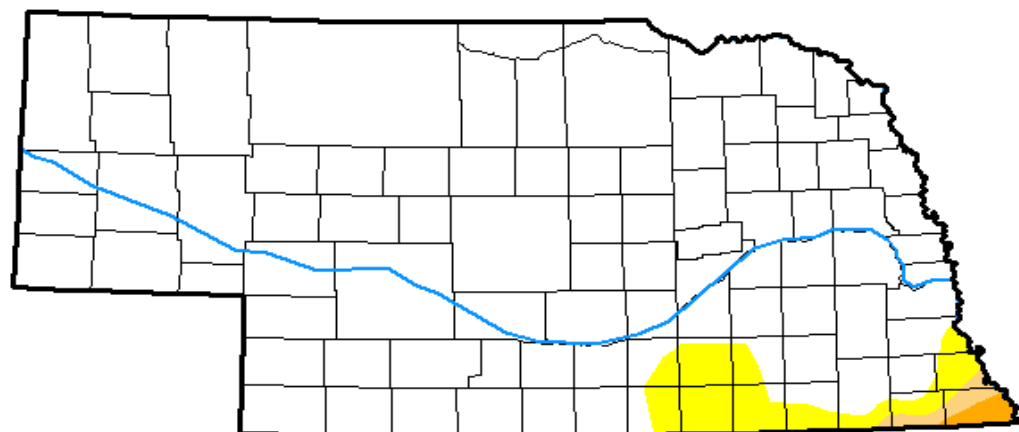
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

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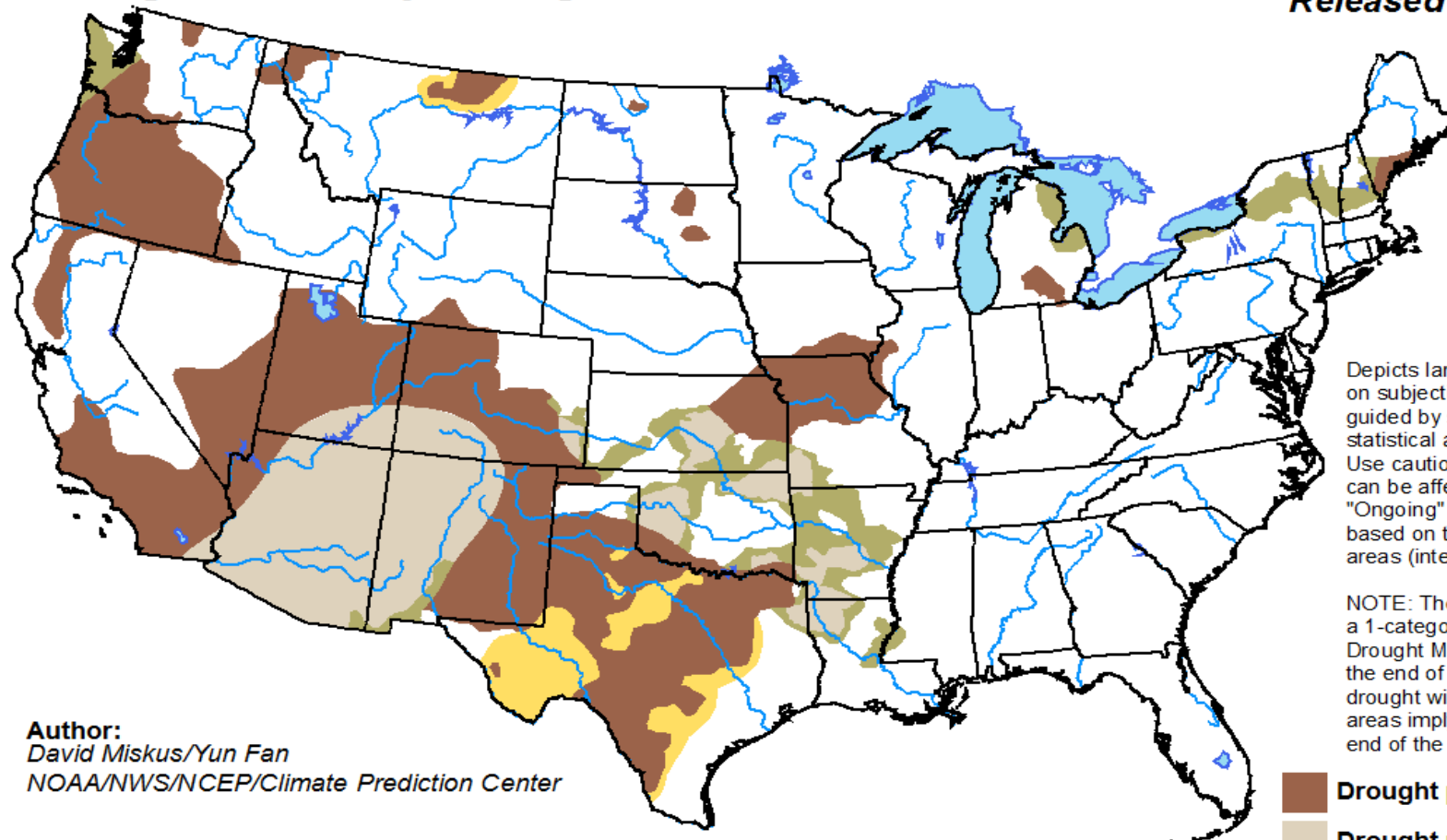
<http://droughtmonitor.unl.edu/>



U.S. Monthly Drought Outlook

Drought Tendency During the Valid Period





Valid for August 2018
Released July 31, 2018

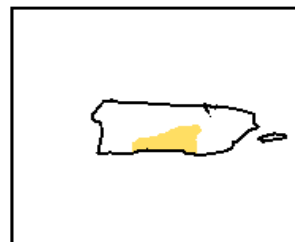
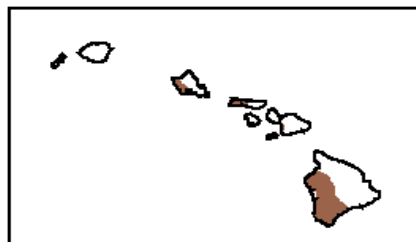
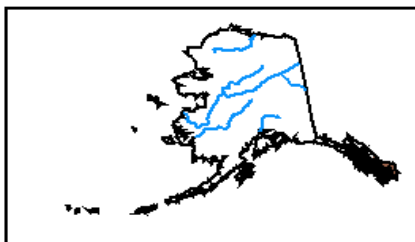


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

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-  Drought persists
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely



<http://go.usa.gov/3eZGd>

ARBOVIRAL DETECTIONS

To date, there has been 37 positive arbovirus positive mosquito pools detected in 12 different counties. The statewide WNV cumulative mosquito minimum infection rate (MIR) per 1,000 *Culex* increased to 1.29 which is slightly above the 10-year median of 1.28 for this time of year.

Table 1. Arboviral Detections

Date Collected	County	Mosquito Species	Virus
8/1/2018	Red Willow	<i>Culex tarsalis</i>	WNV
8/1/2018	Red Willow	<i>Culex tarsalis</i>	WNV
8/1/2018	Red Willow	<i>Culex tarsalis</i>	WNV
7/31/2018	Dawes	<i>Culex tarsalis</i>	WNV
7/31/2018	Holt	<i>Culex tarsalis</i>	WNV
7/31/2018	Holt	<i>Culex pipiens</i>	WNV
7/31/2018	Holt	<i>Culex pipiens</i>	WNV
7/31/2018	Holt	<i>Culex unknown</i>	WNV
7/31/2018	Wayne	<i>Culex tarsalis</i>	WNV
7/25/2018	Dawes	<i>Culex tarsalis</i>	WNV
7/24/2018	Box Butte	<i>Culex tarsalis</i>	WNV
7/24/2018	Box Butte	<i>Culex tarsalis</i>	WNV
7/24/2018	Box Butte	<i>Culex tarsalis</i>	WNV
7/24/2018	Dawson	<i>Culex pipiens</i>	WNV
7/24/2018	Douglas	<i>Culex pipiens</i>	WNV
7/24/2018	Douglas	<i>Culex pipiens</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV

7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
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7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Douglas	<i>Culex tarsalis</i>	WNV
7/24/2018	Madison	<i>Culex tarsalis</i>	WNV
7/17/2018	Garden	<i>Culex tarsalis</i>	WNV
7/17/2018	Scotts Bluff	<i>Culex tarsalis</i>	WNV
7/17/2018	Wayne	<i>Culex tarsalis</i>	WNV
7/10/2018	Box Butte	<i>Culex tarsalis</i>	WNV
6/7/2018	Lancaster	<i>Culex pipiens</i>	WNV
6/6/2018	Phelps	<i>Culex tarsalis</i>	WNV

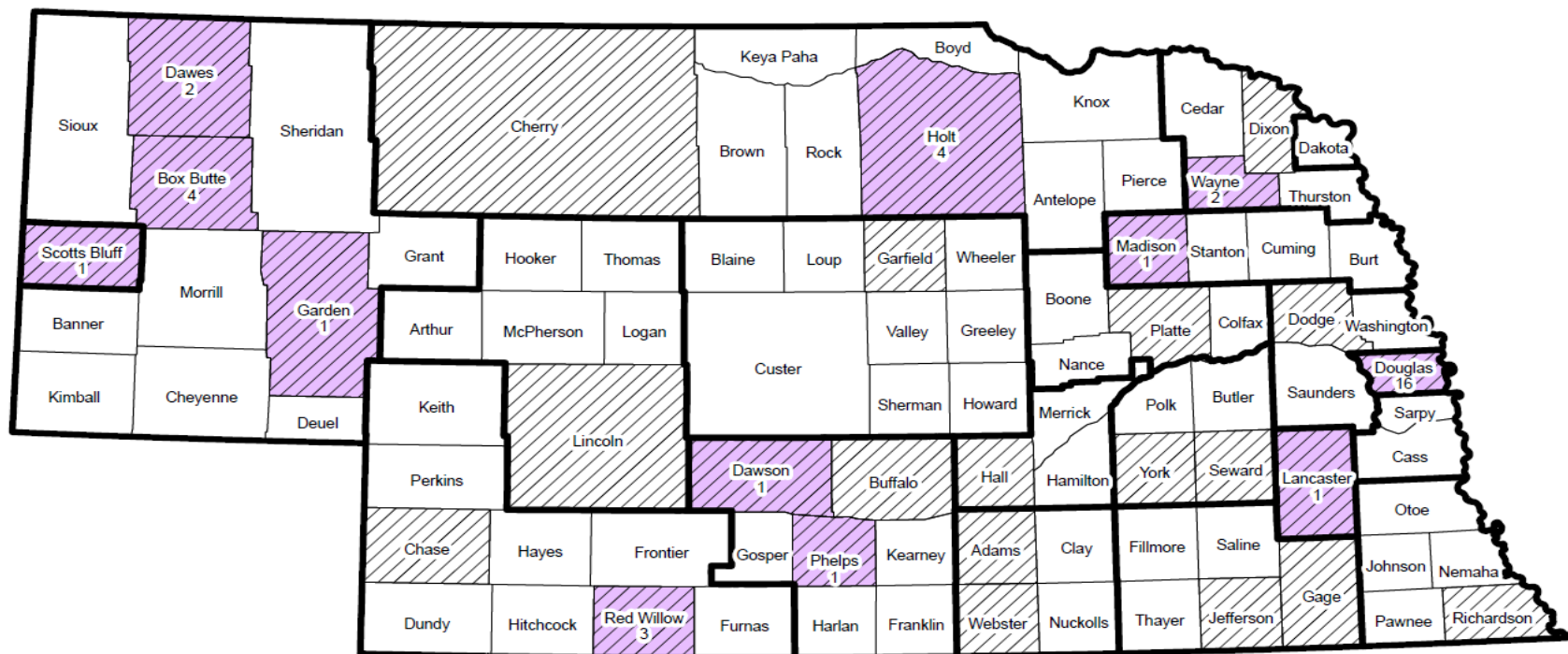
Table 2. Arboviral Detections Summary Table.

			Virus			
Date Collected	County	Mosquito Species	WNV	SLE	WEE	Total
8/1/2018	Red Willow	<i>Culex tarsalis</i>	1	0	0	1
8/1/2018	Red Willow	<i>Culex tarsalis</i>	1	0	0	1
8/1/2018	Red Willow	<i>Culex tarsalis</i>	1	0	0	1
7/31/2018	Dawes	<i>Culex tarsalis</i>	1	0	0	1
7/31/2018	Holt	<i>Culex tarsalis</i>	1	0	0	1
7/31/2018	Holt	<i>Culex pipiens</i>	1	0	0	1
7/31/2018	Holt	<i>Culex pipiens</i>	1	0	0	1
7/31/2018	Holt	<i>Culex unknown</i>	1	0	0	1
7/31/2018	Wayne	<i>Culex tarsalis</i>	1	0	0	1

[illegible]

Mosquito Surveillance Nebraska CDC Light Trap Network, 2018

As of August 10



Legend

- West Nile Positive (WNV)
- Routine Trapping Sites (28)
- Surveillance Regions

SLE Positive / Tested Totals

Mosquito Pools: 0 / 1350

Counties: 0 / 28

WNV Positive / Tested Totals

Mosquito Pools: 37 / 1350

Counties: 12 / 28

Figure 1. Positive mosquito pools in the Nebraska CDC light trap network, 2018.

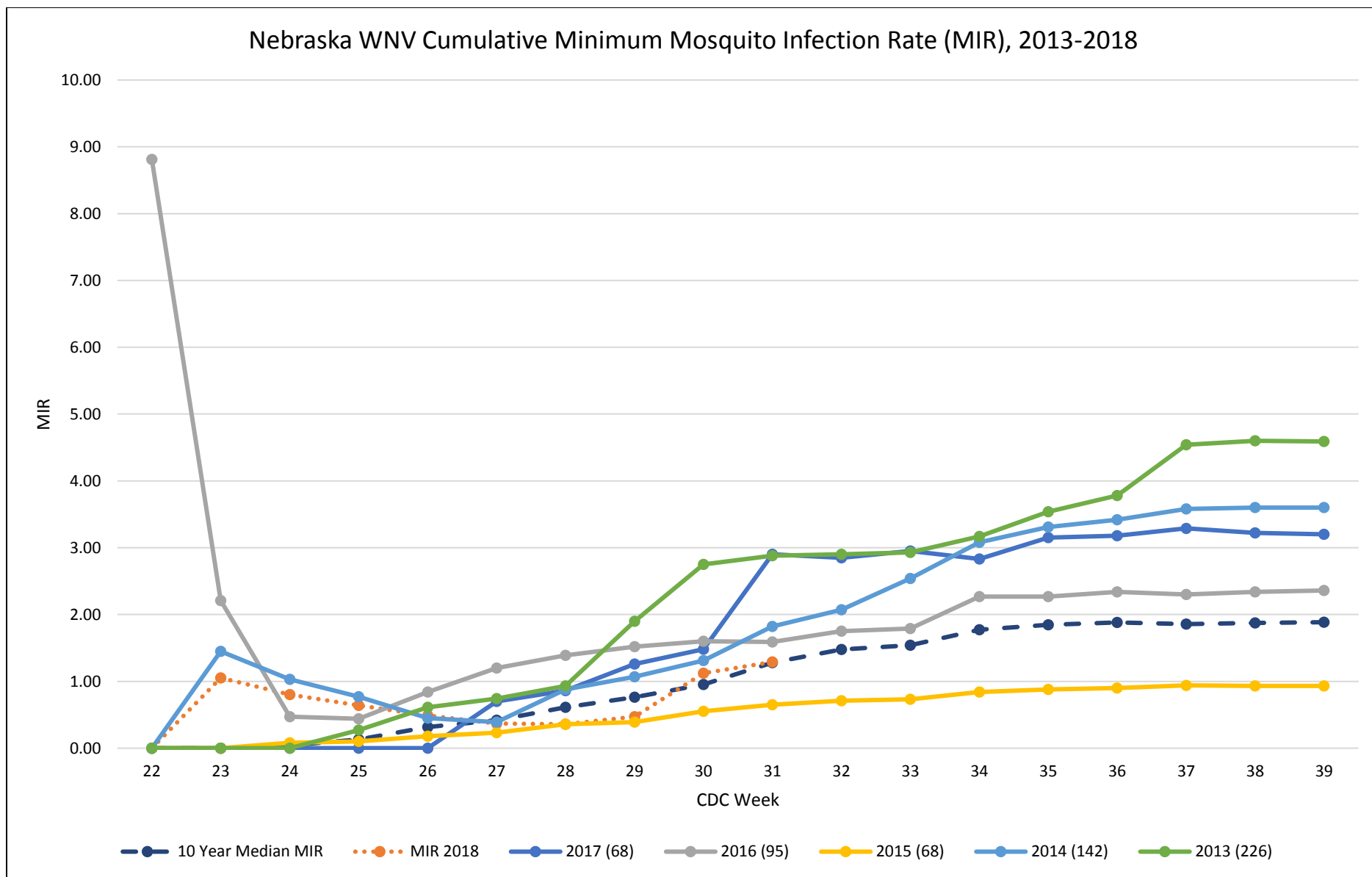


Figure 2. Weekly Nebraska WNV Mosquito Cumulative Mosquito Minimum Infection Rate, 2013-2018. At the state level, the calculated statewide MIR is strongly correlated with the number of human clinical WNV cases. As such, comparisons during the season of the weekly cumulative MIR with previous seasons' cumulative MIRs may give an indication as to how severe a WNV season might be. Please note 2018 data is shown as a dotted line and the 10-year median as a dashed line. Numbers in parentheses next to years indicate the number of human WNV clinical cases reported that year.

HUMAN MOSQUITO-BORNE DISEASE CASES

Weekly reported cases (confirmed and probable) of human clinical mosquito-borne disease infections in Nebraska residents is summarized in the table below (pg. 13 and 14). It includes human infections of West Nile virus (WNV), St. Louis Encephalitis virus (SLE), Western Equine Encephalitis virus (WEE), chikungunya (CHIKV), dengue (DENV), Zika, and malaria. Please note that cases are by earliest report date of infection not necessarily by date of onset. Table only includes reported cases that had exposure or onset of disease in 2018. All data is preliminary and may change as more information is received.

Table 3. Reports of Mosquito-Borne Disease in Nebraska, 2018

CDC Week	Week Ending Date	WNV^ (Clinical Cases)	WNV^ (Asymptomatic Blood Donors)	SLE^	WEE^	CHIKV*	DENV*	ZIKA*	Malaria*	Total
1	6-Jan-18	0	0	0	0	0	0	0	0	0
2	13-Jan-18	0	0	0	0	0	0	0	0	0
3	20-Jan-18	0	0	0	0	0	0	0	0	0
4	27-Jan-18	0	0	0	0	0	0	0	0	0
5	3-Feb-18	0	0	0	0	0	0	0	1	1
6	10-Feb-18	0	0	0	0	0	0	0	0	0
7	17-Feb-18	0	0	0	0	0	0	0	0	0
8	24-Feb-18	0	0	0	0	0	0	0	0	0
9	3-Mar-18	0	0	0	0	0	0	0	0	0
10	10-Mar-18	0	0	0	0	0	0	0	0	0
11	17-Mar-18	0	0	0	0	0	0	0	0	0
12	24-Mar-18	0	0	0	0	0	0	0	0	0
13	31-Mar-18	0	0	0	0	0	0	0	0	0
14	7-Apr-18	0	0	0	0	0	0	0	1	1
15	14-Apr-18	0	0	0	0	0	0	0	0	0
16	21-Apr-18	0	0	0	0	0	0	0	0	0

17	28-Apr-18	0	0	0	0	0	0	0	0	0
18	5-May-18	0	0	0	0	0	0	0	0	0
19	12-May-18	0	0	0	0	0	0	0	0	0
20	19-May-18	0	0	0	0	0	0	0	0	0
21	26-May-18	0	0	0	0	0	0	0	0	0
22	2-Jun-18	0	0	0	0	0	0	0	0	0
23	9-Jun-18	0	0	0	0	0	0	0	0	0
24	16-Jun-18	0	0	0	0	0	0	0	1	1
25	23-Jun-18	0	0	0	0	0	0	0	0	0
26	30-Jun-18	0	0	0	0	0	0	0	0	0
27	7-Jul-18	1	0	0	0	0	1	0	0	2
28	14-Jul-18	1	0	0	0	0	0	0	0	1
29	21-Jul-18	1	1	0	0	0	0	0	0	2
30	28-Jul-18	0	0	0	0	0	0	0	0	0
31	4-Aug-18	2	1	0	0	0	0	0	0	3
32	11-Aug-18	3	3	0	0	0	0	0	0	6
Total		8	5	0	0	0	1	0	3	17

^These are endemic viruses that have been historically transmitted by mosquitoes in Nebraska and maybe acquired within the state. It should be noted that reports are for Nebraska residents and that infection may have been acquired elsewhere. *These diseases are typically acquired via travel overseas to areas where the virus or parasite is endemic. Currently, Nebraska does not have local transmission via mosquitoes of these organisms and the probability of local transmission by local mosquitoes is thought to be very low and not expected. However, to further lower and prevent the chance of local transmission of these “travel-related” diseases, returning travelers or visitors from these areas should prevent mosquito bites for at least three weeks upon arrival to Nebraska. Additionally, although cases of CHIKV, DENV, and ZIKA are most often acquired via overseas travel, small areas of transmission and small, local outbreaks within the U.S. have occurred and may occur in the future. Examples of states that have seen local transmission include: Florida, (DENV, CHIKV, and ZIKA), Hawaii (DENV), and Texas (DENV, CHIKV, and ZIKA).

Table 4. Human WNV Clinical Case Information, Nebraska 2018

Age Range	Number
0 to 10	0
11 to 20	0
21 to 30	1
31 to 40	0
41 to 50	1
51 to 60	3
61 to 70	3
71+	0
Gender	
Male	7
Female	1
Diagnosis	
WNV Neuroinvasive Disease	4
WNV Non-Neuroinvasive Disease	4
Hospitalized	2
Death	0

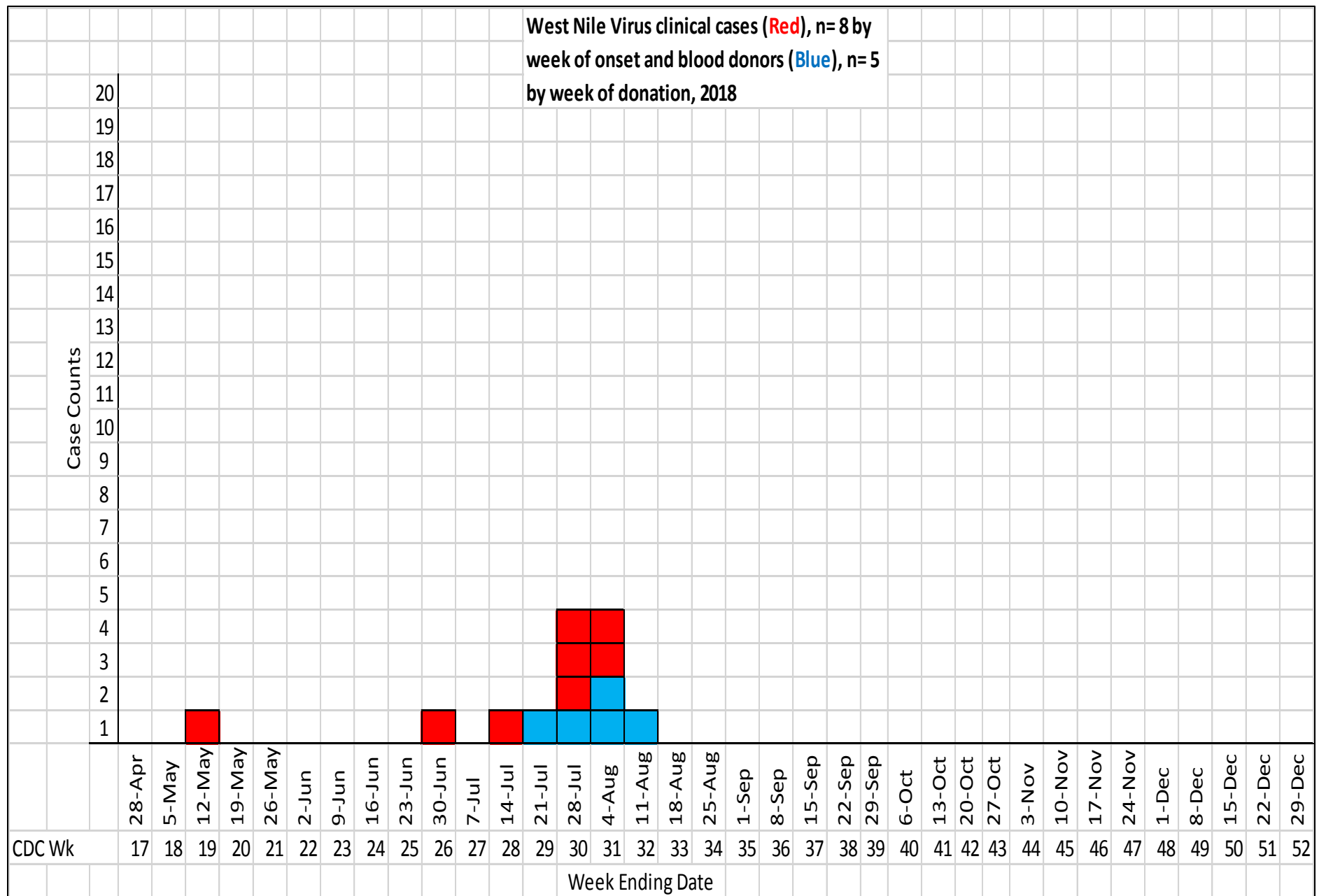


Figure 3. Epi-curve of human WNV infections (clinical and asymptomatic blood donors) by onset date, Nebraska 2018.

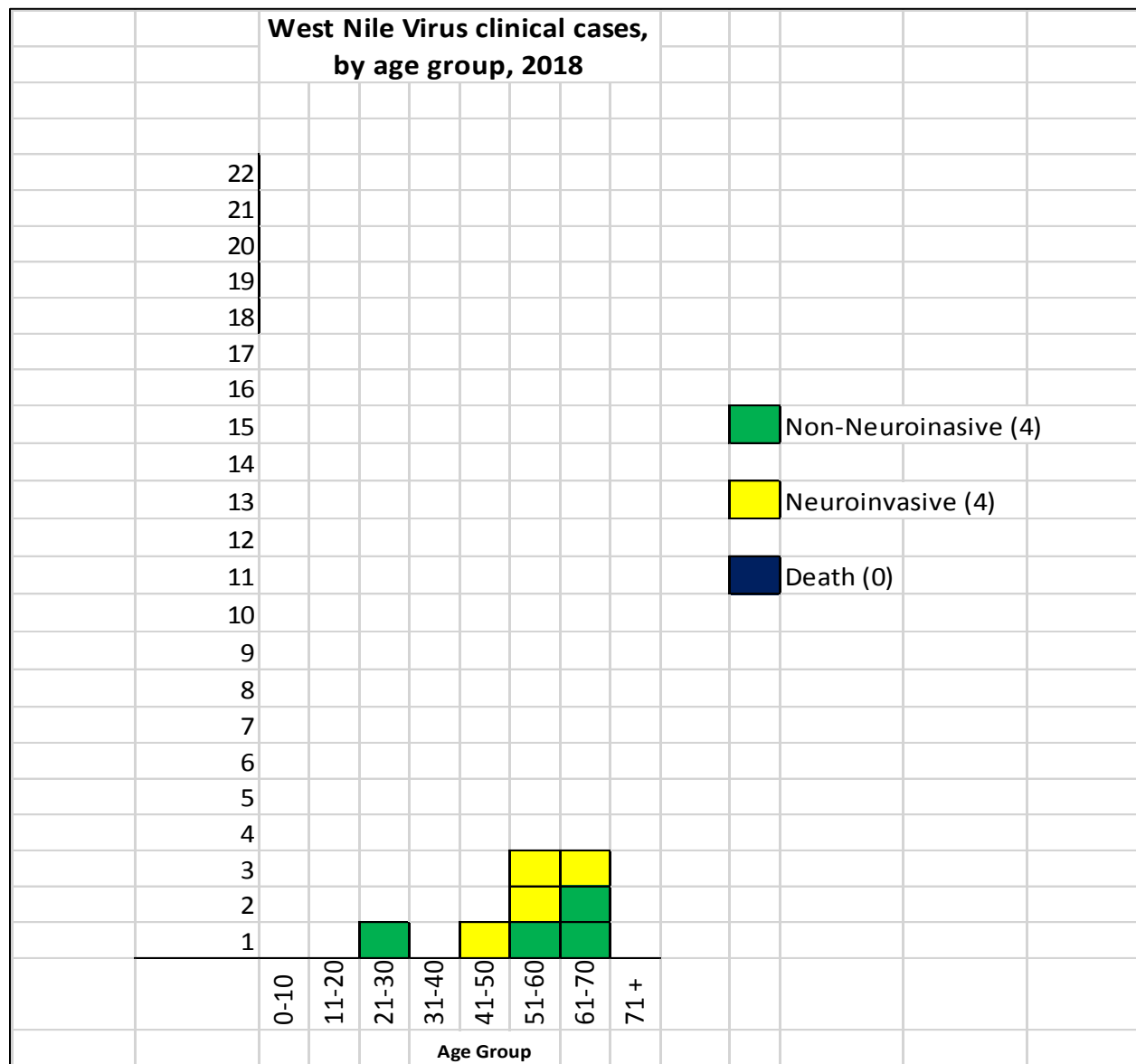


Figure 4. WNV human clinical cases by 10 year age groups, 2018.

Human Clinical Positives for West Nile Virus, Nebraska, 2018, (n = 8)

As of August 10

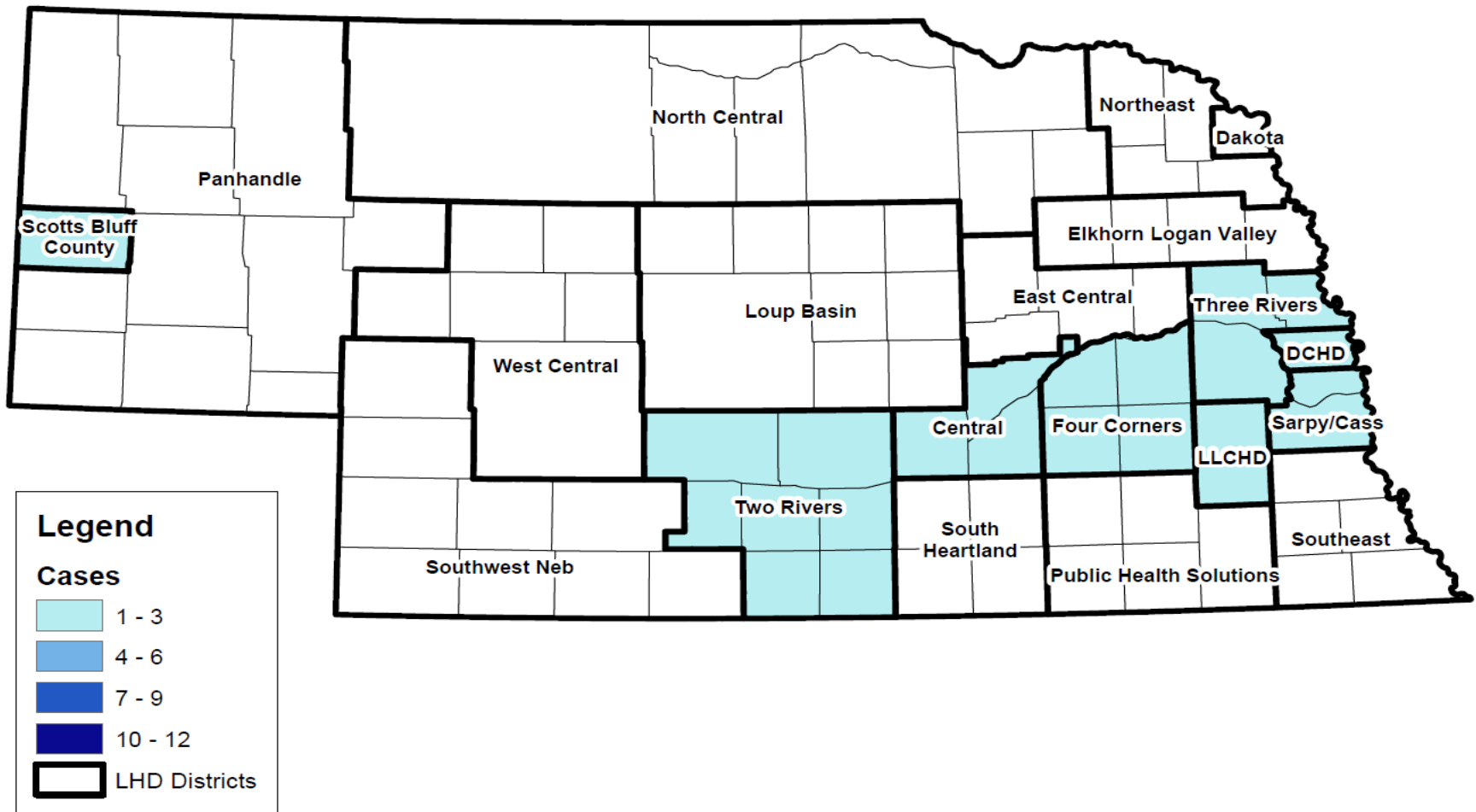


Figure 5. Nebraska human clinical WNV cases by local health jurisdiction, 2018.

Table 5. Number of Human WNV Clinical Cases by Onset Week and Nebraska Local Health Jurisdiction, 2018

Local Health Department Human Clinical Cases Onset Week

CDC Wk.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
Local Health Dept. Jurisdiction																	Total
Central District Health Dept.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Dakota County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
East Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elkhorn-Logan Valley Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Four Corners Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lincoln-Lancaster County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Loup Basin Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Panhandle Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Public Health Solutions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sarpy-Cass Dept. of Health and Wellness	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Scotts Bluff County Health Dept.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
South Heartland District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southeast District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southwest Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Three Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Two Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
West Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Statewide Total	0	0	1	0	0	0	0	0	0	1	0	1	0	3	2	0	8

Human Blood Donor Positives for West Nile Virus, Nebraska, 2018, (n = 1)

As of August 3

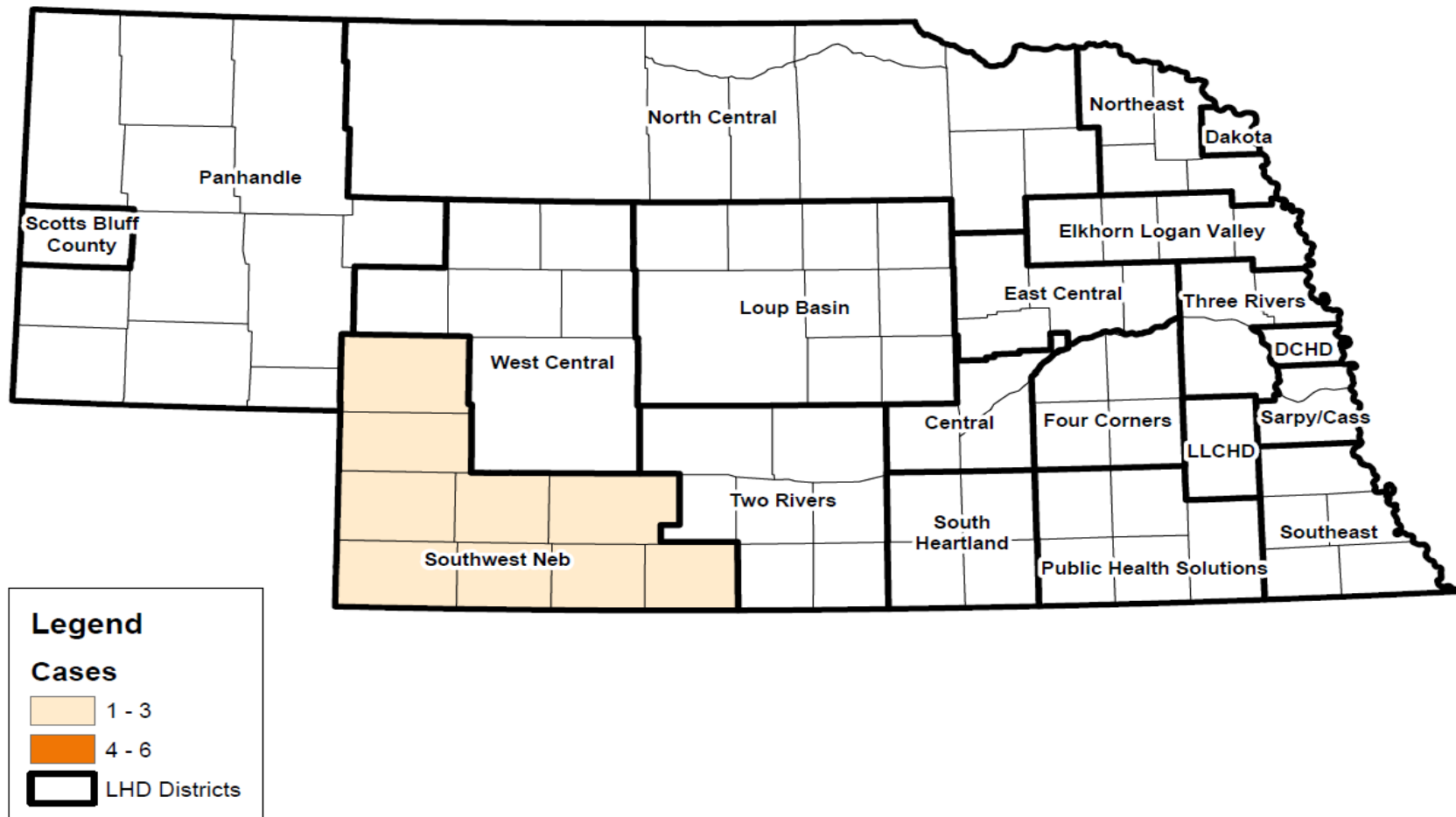


Figure 6. Nebraska asymptomatic WNV blood donors by local health jurisdiction, 2018.

Table 6. Number of Human WNV Blood Donors by Week of Donation and Nebraska Local Health Jurisdiction, 2018

Local Health Department Human Blood Donor Cases by Week Reported

CDC Wk.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
Local Health Dept. Jurisdiction																	Total
Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dakota County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
East Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elkhorn-Logan Valley Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Four Corners Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln-Lancaster County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loup Basin Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Panhandle Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public Health Solutions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Sarpy-Cass Dept. of Health and Wellness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scotts Bluff County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Heartland District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southeast District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southwest Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
Three Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Statewide Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	5

Comment: WNV is the most widespread, locally acquired mosquito-borne disease in Nebraska. The state has one of the highest incidences of WNV in the U.S. and the virus is highly endemic to the state. **Four human clinical cases have been reported in Nebraska residents to date along with the first positive asymptomatic human blood donor.** Additionally, **15 positive WNV mosquito pools have been detected indicating WNV is circulating in the environment.** Overall WNV risk will continue to increase as we move into the month of August. This is typically the highest risk for exposure in Nebraska. It is important to note that there are many factors that come into play in determining an individual person's risk of acquiring WNV and other mosquito-borne diseases. **Low WNV activity or no WNV activity detected DOES NOT mean NO RISK!** For travel related mosquito-borne diseases (confirmed and probable cases), three cases of malaria (South Sudan= 1 and Togo= 2) and one case of dengue (Thailand= 1) have been reported this year. Anytime mosquitoes are active there is always the possibility of acquiring WNV or another mosquito-borne disease and proper mosquito prevention methods should be utilized both here at home and when traveling abroad. Examples include:

- Applying an EPA approved mosquito repellent (DEET, picaridin, oil of lemon eucalyptus, or IR3535).
- Limiting exposure when outdoors by wearing long sleeve shirts and pants.
- Limiting time spent outdoors when mosquitoes are most active, typically dusk to midnight.
- Getting rid of standing water that mosquitoes may breed in at least once a week. Remember to change water in outdoor pet watering dishes along with bird baths and dump out water in flower pots, garden containers, or other objects that may hold water.

For more information on mosquito-borne diseases and prevention information please visit the following websites:

<http://dhhs.ne.gov/wnv> (Nebraska Department of Health and Human Services WNV Surveillance Program web site).

<http://dhhs.ne.gov/publichealth/EPI/Pages/Mosquito-borne.aspx> (Nebraska Department of Health and Human Services Mosquito-Borne Disease web site and links to downloadable educational pamphlets).

<https://www.cdc.gov/westnile/> (CDC West Nile Virus web site).

<https://www.cdc.gov/sle/> (CDC St. Louis Encephalitis Virus web site).

<https://www.cdc.gov/chikungunya/index.html> (CDC Chikungunya Virus web site).

<https://www.cdc.gov/dengue/index.html> (CDC Dengue Virus web site).

<https://www.cdc.gov/zika/index.html> (CDC Zika Virus web site).

<https://www.cdc.gov/parasites/malaria/index.html> (CDC Malaria web site).

<https://www.cdc.gov/features/stopmosquitoes/index.html> (CDC Avoid Mosquito Bites web site).

MOSQUITO RESULTS

The Nebraska CDC light trap network consists of 143 traps set across the state to monitor mosquito populations and test for the presence of arboviruses circulating in the state's mosquito populations.

Total mosquito and *Culex* mosquito counts from CDC light traps are described in relative terms based on individual historical county data and are depicted in the tables below:

0 to 40th percentile	41st to 60th percentile	61st to 80th percentile	81st to 97th percentile	>97th percentile
Low	Mod.	High	Very High	Extremely High

The individual county mosquito trapping data for the final trap period can be found on pg. 23-24.

Table 7. Nebraska CDC Light Trap Network Mosquito Results, 2018

	CDC Weeks 30/31	
Region/County	Total Mosquito	Total Culex
West Region	365.63	172.22
Box Butte	1257.00	859.00
Chase	20.33	4.17
Cherry	209.00	75.83
Dawes	184.17	135.00
Garden	851.33	258.17
Lincoln	297.33	7.33
Red Willow	57.83	21.00
Scotts Bluff	259.67	62.17
	CDC Weeks 30/31	
Region/County	Total Mosquito	Total Culex
Central Region	46.02	23.84

Adams	15.67	15.67
Buffalo	2.83	2.67
Dawson	22.00	19.33
Garfield	72.00	13.67
Hall	4.67	1.83
Holt	199.17	120.33
Phelps	2.83	2.67
Webster	33.83	10.50
	CDC Weeks 30/31	
Region/County	Total Mosquito	Total Culex
East Region	136.96	115.06
Dixon	110.00	106.00
Dodge	34.60	27.20
Douglas	665.33	607.33
Gage	74.50	9.50
Jefferson	34.75	28.25
Lancaster	57.67	36.17
Madison	81.50	63.67
Platte	83.60	53.40
Richardson	22.50	18.17
Seward	5.00	5.00
Wayne	151.67	138.67
York	10.00	6.00

Each county or region represents the average for all CDC light trapping sites in that county or region. ND= No Data.

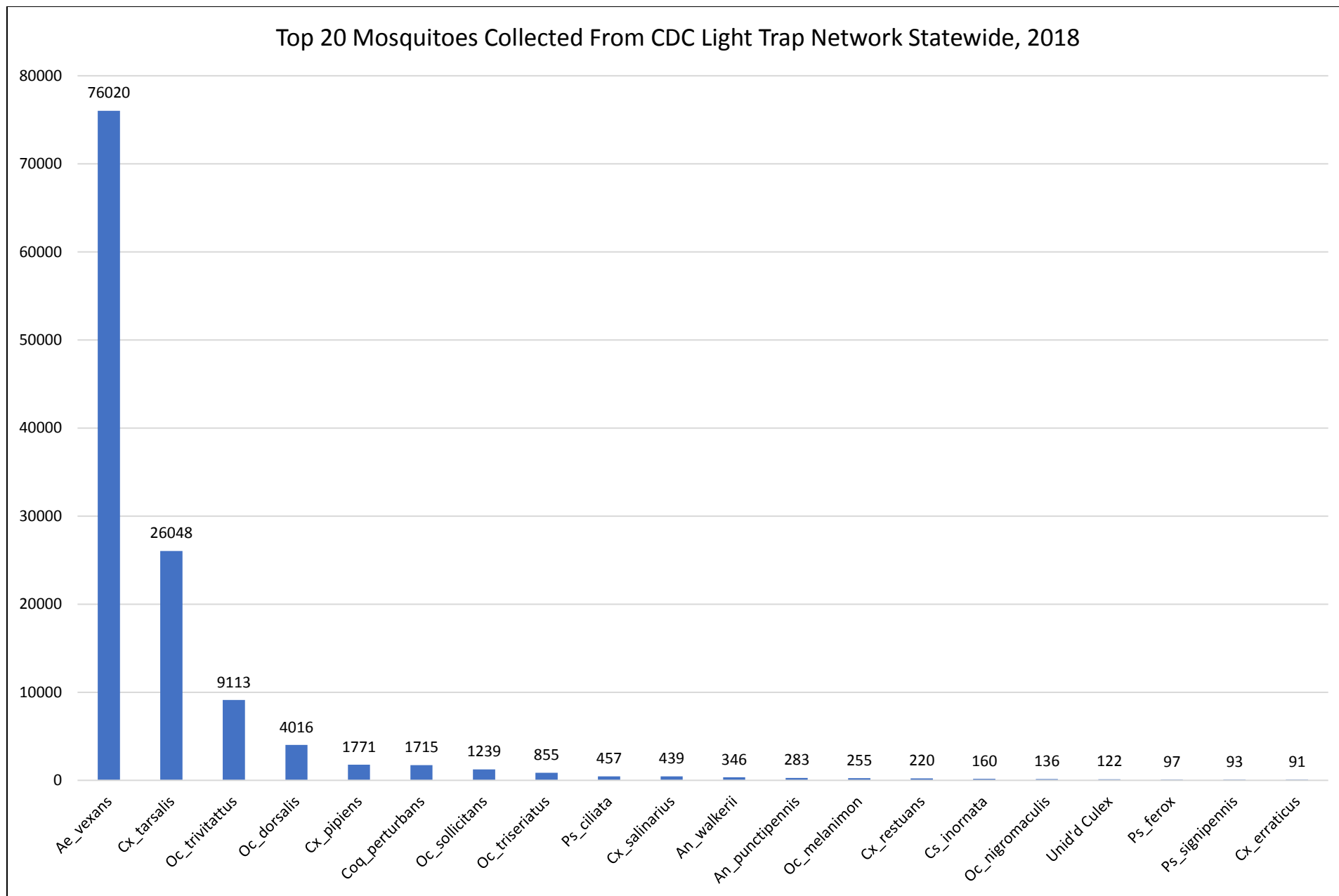


Figure 7. Top 20 cumulative mosquitoes collected statewide from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, Unid'd= Unidentified.

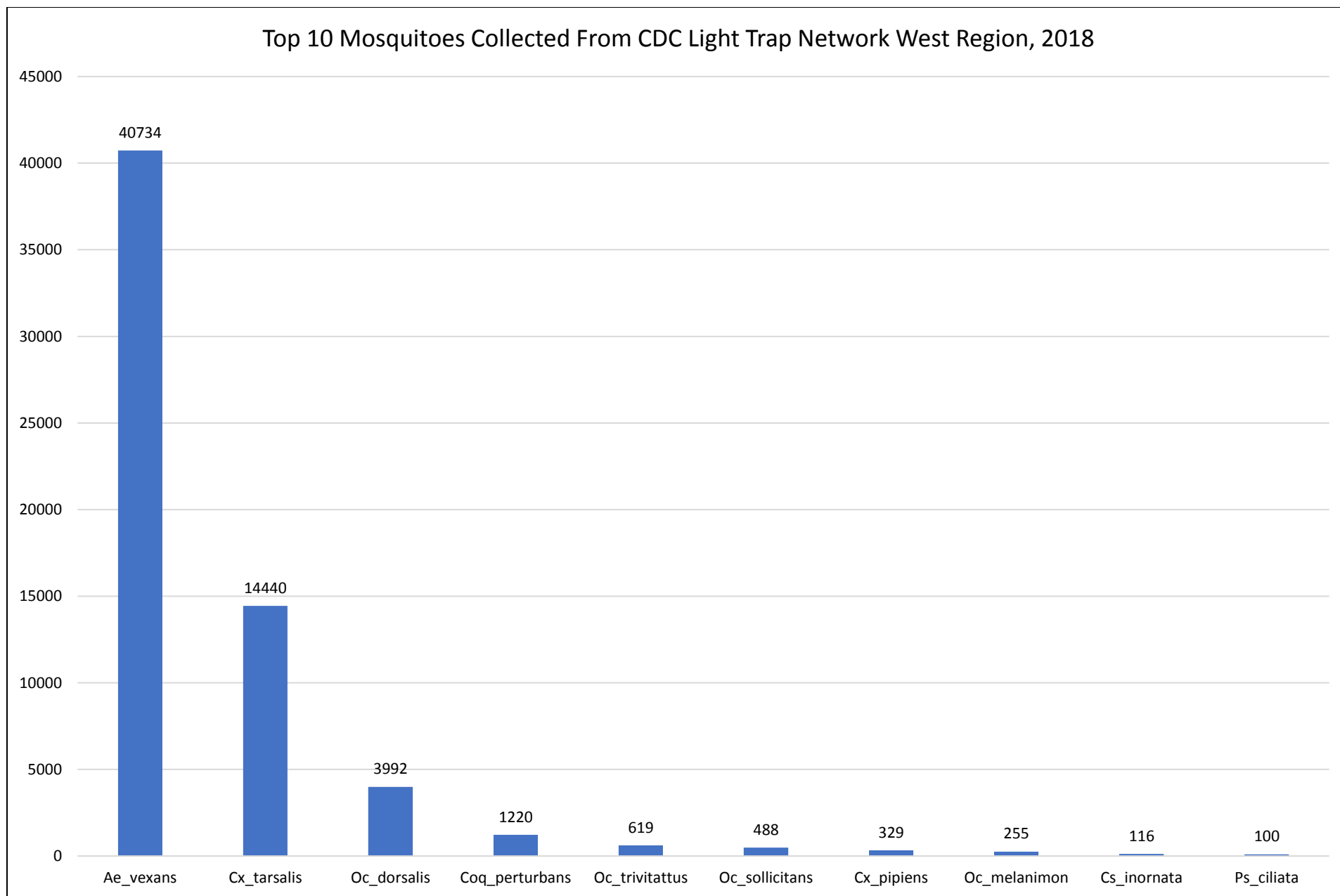


Figure 8. Top 10 cumulative mosquitoes collected in West region of the state from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, and Unid'd= Unidentified.

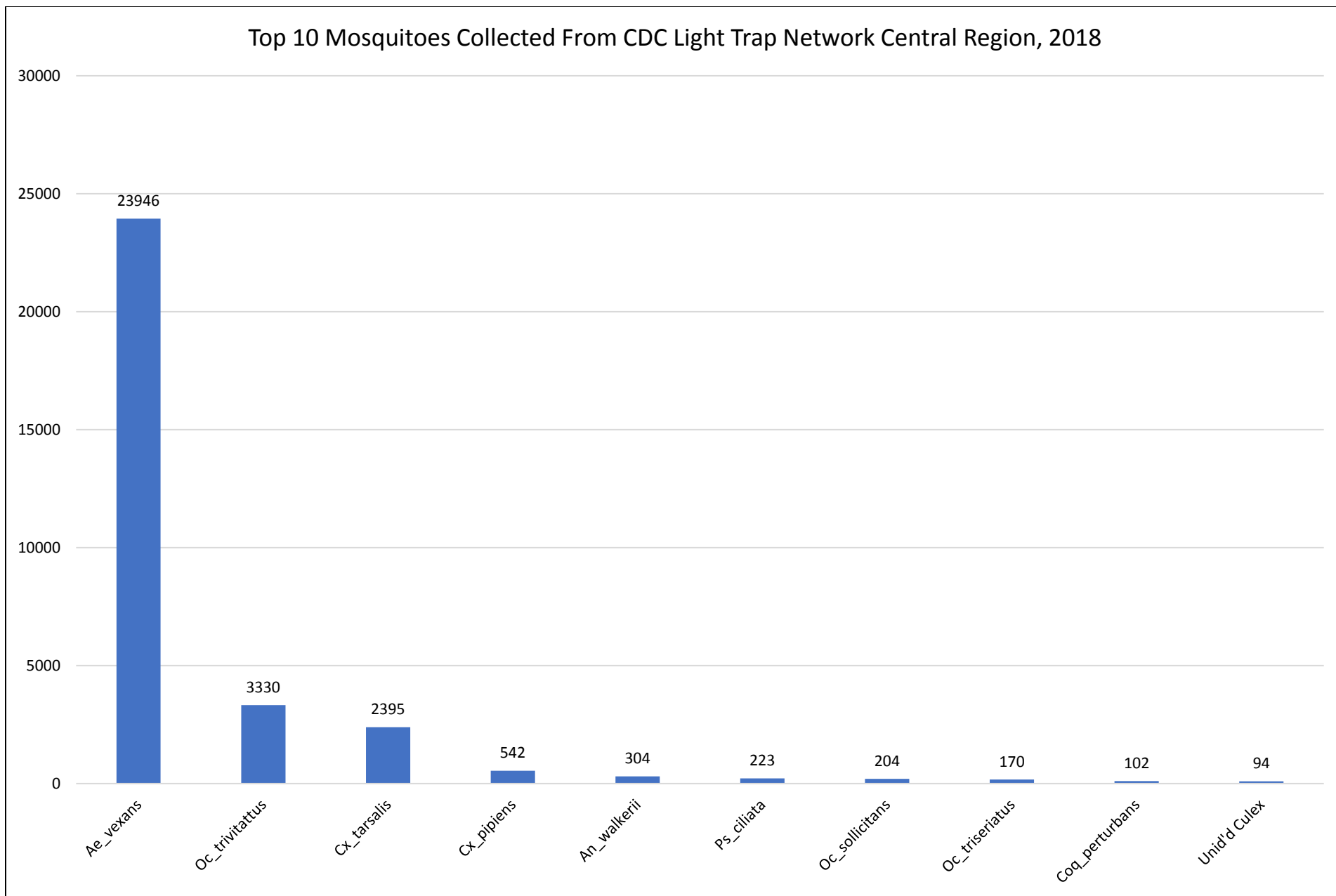


Figure 9. Top 10 cumulative mosquitoes collected in Central region of the state from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, and Unid'd= Unidentified.

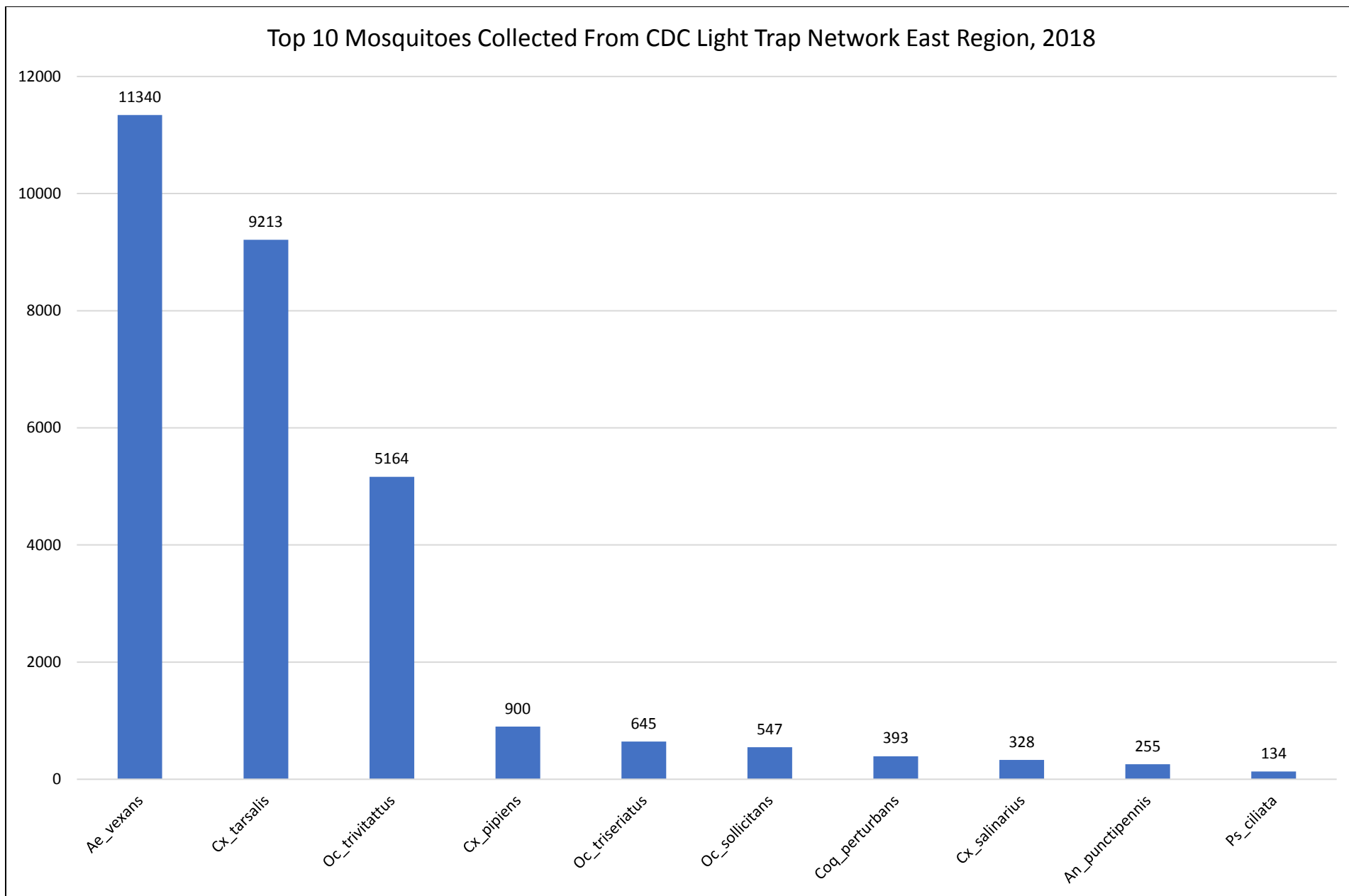


Figure 10. Top 10 cumulative mosquitoes collected in East region of the state from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culesita*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, and Unid'd= Unidentified.

The Nebraska BG Sentinel 2 trap network was established to better survey areas of eastern and southeastern Nebraska for the presence of the invasive *Aedes albopictus* (Asian tiger) mosquito. During the season, four local health departments will participate in this trap network including: Douglas County Health Dept., Lincoln-Lancaster Health Dept., Sarpy-Cass Health Dept., and Southeast District Health Dept. For the season, counting all trap sites and types (CDC light and BG sentinel 2) from across the state, a total of 125,134 mosquitoes were captured with 86 (0.069%) *Aedes albopictus* collected.

Table 8. Cumulative Trap Collections in Counties Performing BG Sentinel 2 Trapping, 2018.

County	Trap Type	Total Mosquitoes	Total Culex	Total Ae_albopictus
Cass	CDC Light	NA	NA	NA
	BG Sentinel 2	3	2	0
Cass Co. Overall Total		3	2	0
Douglas	CDC Light	6999	3814	0
	BG Sentinel 2	1030	328	0
Douglas Co. Overall Total		8029	4142	0
Lancaster	CDC Light	2462	490	0
	BG Sentinel 2	93	25	0
Lancaster Co. Overall Total		2555	515	0
Nemaha	CDC Light	NA	NA	NA
	BG Sentinel 2	8	7	0
Nemaha Co. Overall Total		8	7	0
Otoe	CDC Light	NA	NA	NA
	BG Sentinel 2	1	0	0
Otoe Co. Overall Total		1	0	0
Richardson	CDC Light	974	492	67
	BG Sentinel 2	68	42	19
Richardson Co. Overall Total		1042	534	86
Sarpy	CDC Light	NA	NA	NA
	BG Sentinel 2	77	71	0
Sarpy Co. Overall Total		77	71	0

Overall Total		11715	5271	86
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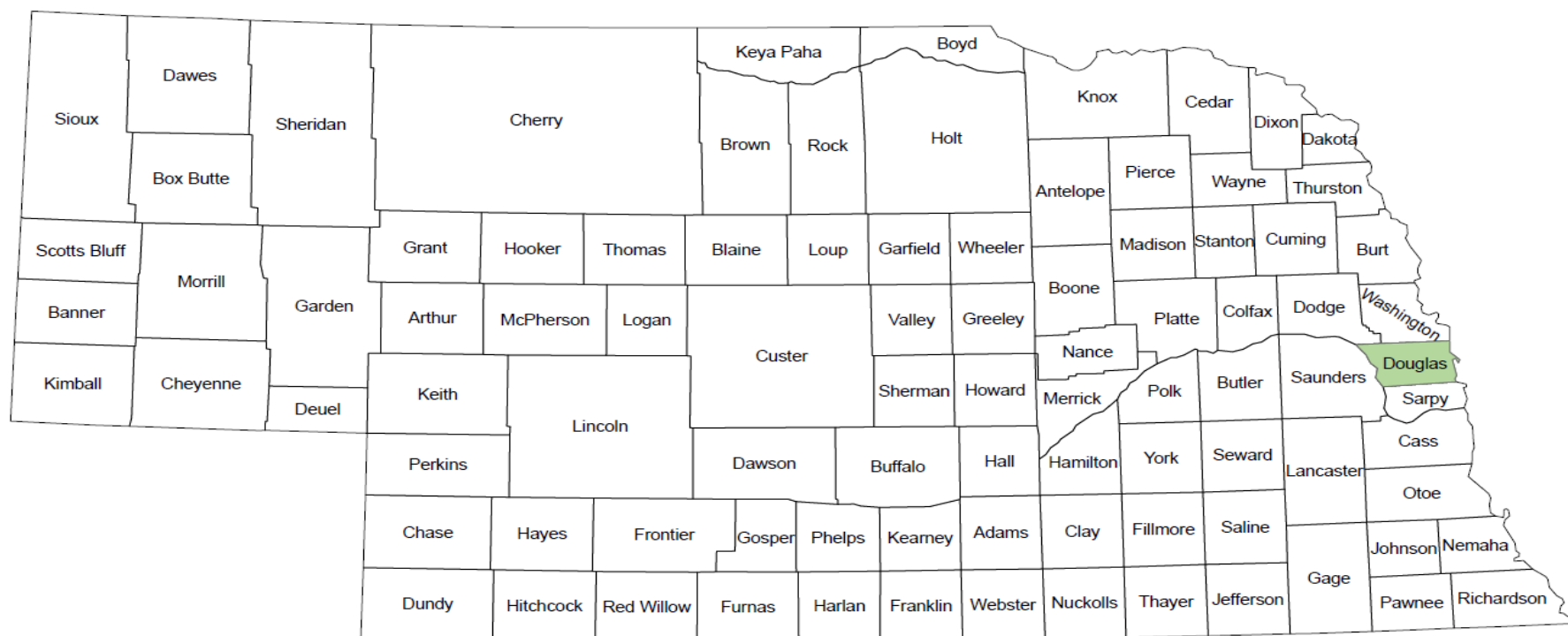
Note: ND= No data, NA = Not applicable.

Bird and Equine Surveillance

Dead bird reporting: For the season, 125 dead birds have been reported to the Nebraska DHHS dead bird database. Of these, six have met the established criteria for WNV testing. The first WNV positive of the season in a bird was reported from Douglas County (see Figure 11 below). Additionally, three have been negative, one was unsuitable for testing, and one test result is pending.

West Nile Virus Dead Bird Surveillance 2017

As of August 10



Legend

Positive

Positive / Tested Totals

Birds: 1 / 6

Figure 11. Positive WNV birds detected in the Nebraska, 2018.

Equine surveillance: For the season no equine WNV case has been reported to the Nebraska DHHS.



Fight the Bite!!